Auxiliary contact blocks - with spring terminals
Accessories

CA3-10S

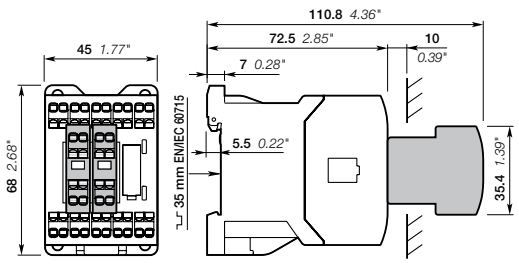
Description

The auxiliary contact blocks are used for the operation of auxiliary circuits and control circuits.
CA3 1-pole auxiliary contact blocks, designed for standard industrial environments, are equipped with:
– N.O. or N.C. contacts.
– spring-type connecting terminals.
All 1-pole auxiliary contact blocks are protected against accidental direct contact and bear the corresponding function marking.
A maximum of two 1-pole auxiliary contact blocks can be front-mounted on 1-stack contactors or 1-stack contactor relays.

Ordering details

For contactors	For contactor relays	Contact blocks		Type	Order code		Pkg qty	Weight (1 pce) kg
1-pole auxiliary contact blocks with spring terminals								
AS09..S ... AS16..S	NS..S, NSL..S	1	–	CA3-10S	1SBN011019T1010		10	0.011
ASL09..S ... ASL16..S		–	1	CA3-01S	1SBN011019T1001		10	0.011

Main dimensions mm, *inches*



Auxiliary contact blocks - with spring terminals
Front mounting

Technical data

Types		1-pole **CA3..S**

Contact utilization characteristics according to IEC

Standards		IEC 60947-5-1 and EN 60947-5-1
Rated insulation voltage Ui acc. to IEC 60947-5-1		690 V
Rated impulse withstand voltage Uimp		6 kV
Rated operational voltage Ue max.		690 V
Conventional thermal current Ith - θ ≤ 40 °C		10 A
Ie / Rated operational current AC-15		
acc. to IEC 60947-5-1	**24-127 V 50/60 Hz**	6 A
	220-240 V 50/60 Hz	4 A
	400-440 V 50/60 Hz	3 A
	500 V 50/60 Hz	2 A
	690 V 50/60 Hz	2 A
Making capacity		10 x Ie AC-15 acc. to IEC 60947-5-1
Breaking capacity		10 x Ie AC-15 acc. to IEC 60947-5-1
Ie / Rated operational current DC-13		
acc. to IEC 60947-5-1	**24 V DC**	6 A / 144 W
	48 V DC	2.8 A / 134 W
	72 V DC	1 A / 72 W
	110 V DC	0.55 A / 60 W
	125 V DC	0.55 A / 69 W
	220 V DC	0.27 A / 60 W
	250 V DC	0.27 A / 68 W
Short-circuit protection device gG type fuse		10 A
Rated short-time withstand current Icw	**for 1.0 s**	100 A
θ = 40 °C	**for 0.1 s**	140 A
Minimum switching capacity		12 V / 3 mA
with failure rate acc. to IEC 60947-5-4		10^{-7}
Power dissipation per pole at 6 A		0.1 W
Mechanical durability		
Number of operating cycles		10 millions operating cycles
Max. switching frequency		3600 cycles/h
Max. electrical switching frequency	**AC-15**	1200 cycles/h
	AC-13	900 cycles/h
Mechanically linked contact acc. to annex L of IEC 60947-5-1		Additional N.O. or N.C. auxiliary contacts (CA3..S aux. contact blocks) are mechanically linked contacts
Mirror contacts acc. to annex F of IEC 60947-4-1		Additional N.C. auxiliary contacts (CA3..S aux. contact blocks) are mirror contacts

Contact utilization characteristics according to UL / CSA

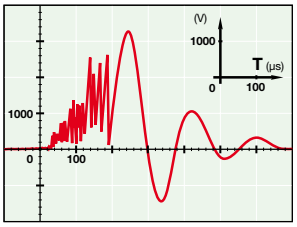
Standards	UL 508, CSA C22.2 N°14
Max. operational voltage	690 V AC, 250 V DC
Pilot duty	A600, Q300
AC thermal rated current	10 A
AC maximum volt-ampere making	7200 VA
AC maximum volt-ampere breaking	720 VA
DC thermal rated current	2.5 A
DC maximum volt-ampere making-breaking	69 VA

Connecting characteristics

Connection capacity (min. ... max.)		
Rigid solid	**1 x**	0.75...2.5 mm²
	2 x	0.75...2.5 mm²
Flexible with non insulated ferrule	**1 x**	0.75...2.5 mm²
	2 x	0.75...2.5 mm²
Flexible with insulated ferrule	**1 x**	0.75...1.5 mm²
	2 x	0.75...1.5 mm²
Connection capacity acc. to UL / CSA	**1 or 2 x**	AWG 18...14
Stripping length		10 mm
Degree of protection		
acc. to IEC 60947-1 / EN 60947-1 and IEC 60529 / EN 60529		IP20
Screw terminals		
All terminals		Spring terminals
Screwdriver type		Flat Ø 3.5

1SBC101498S0201

Surge suppressors for contactor coils
Accessories



Description

The operation of inductive circuits causes overvoltages, in particular on opening the contactor coil.
The electromagnetic energy stored in the coil during contactor closing is restored on opening in the form of surges, the slope and amplitude of which may rise to several kilovolts. A number of drawbacks are observed ranging from interference on the electronic devices to the breakdown of insulators and even the destruction of certain sensitive components.
The graph opposite reproduces the oscillogram showing voltage discharges at the terminals of a 42 V / 50 Hz coil without peak clipping. The coil was switched by 8 series-connected poles of a contactor relay.
Following a burst of discharges with a very steep slope, a damped oscillation emerges with a peak value of 3500 V.

Overvoltage Factor

The overvoltage factor k is defined as the ratio of the maximum overvoltage peak value Ûs to the peak value Ûc of the coil rated control voltage Uc:

$$k = \frac{\hat{U}s\ max.}{\hat{U}c} \qquad \text{in DC} \quad k = \frac{\hat{U}s\ max.}{Uc} \qquad \text{in AC} \quad k = \frac{\hat{U}s\ max.}{Uc\ \sqrt{2}}$$

For example the following is obtained for the above graph: $k = \frac{3500}{42\ \sqrt{2}} \approx 60$

To reduce the harmful effects of these overvoltages, ABB has developed a range of surge suppressors designed to reduce the k factor defined above and to limit or even completely eliminate the high pre-damping voltage frequencies.
Each case is different, but the technical data tolerances and generous sizing of parts have enabled us to reduce the number of variants.
We have chosen the following solutions: transil diodes, varistors and RC blocks.
Note: A varistor is a resistor whose value decreases to a very large extent when a certain voltage is applied at its terminals.


1SBC101042F0014
RV5

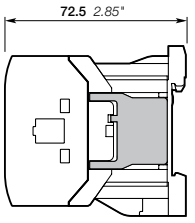

1SBC101042F0014
RC5-1

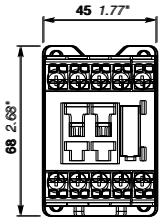

1SBC101042F0014
RT5

Ordering details

For contactors	For contactor relays	Rated control circuit voltage - Uc			Type	Order code		Pkg qty	Weight (1 pce)
		V	DC	AC					kg
AS..S, ASL..S	NS..S, NSL..S	24...50	●	●	RV5/50	1SBN050010R1000		2	0.015
		50...133	●	●	RV5/133	1SBN050010R1001		2	0.015
		110...250	●	●	RV5/250	1SBN050010R1002		2	0.015
		250...440	●	●	RV5/440	1SBN050010R1003		2	0.015
AS..S	NS..S	24...50	–	●	RC5-1/50	1SBN050100R1000		2	0.012
		50...133	–	●	RC5-1/133	1SBN050100R1001		2	0.012
		110...250	–	●	RC5-1/250	1SBN050100R1002		2	0.012
		250...440	–	●	RC5-1/440	1SBN050100R1003		2	0.012
ASL..S	NSL..S	12...32	●	–	RT5/32	1SBN050020R1000		2	0.015
		25...65	●	–	RT5/65	1SBN050020R1001		2	0.015
		50...90	●	–	RT5/90	1SBN050020R1002		2	0.015
		77...150	●	–	RT5/150	1SBN050020R1003		2	0.015
		150...264	●	–	RT5/264	1SBN050020R1004		2	0.015

Main dimensions mm, *inches*





Easy connection to the coil terminals
(parallel mounting)
Clip-on for both fixing and connection.

No additional space
Clipped onto the right side part of the contactor base without changing contactor overall dimensions and keeping a free access to coil terminals.

1SBC101499S0201

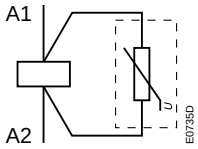
Surge suppressors for contactor coils
Technical data

Varistor	RV5/50	RV5/133	RV5/250	RV5/440
Rated control circuit voltage Uc	24...50 V AC	50...133 V AC	110...250 V AC	250...440 V AC
	24...50 V DC	50...133 V DC	110...250 V DC	250...440 V DC
Residual overvoltage (clipping voltage)	132 V AC	270 V AC	480 V AC	825 V AC
	132 V DC	270 V DC	480 V DC	825 V DC
Opening time growth factor	none			
Operating temperature	-20...+70 °C			
Advantages	High energy absorption: good damping - Unpolarized system.			
Drawback	Clipping as from Uvdr*, thus voltage front up to this point. *Uvdr = Varistor operating voltage (voltage dependent resistor), tolerance ± 10 %.			

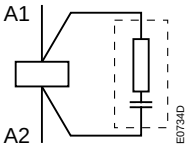
RC type	RC5-1/50	RC5-1/133	RC5-1/250	RC5-1/440
Rated control circuit voltage Uc	24...50 V AC	50...133 V AC	110...250 V AC	250...440 V AC
Residual overvoltage (clipping voltage)	2 to 3 x Uc max.			
Opening time growth factor	2...3			
Operating temperature	-20...+70 °C			
Advantages	Very fast clipping - Attenuation of steep fronts and thus of high frequencies.			

Transil diode	RT5/32	RT5/65	RT5/90	RT5/150	RT5/264
Rated control circuit voltage Uc	12...32 V DC	25...65 V DC	50...90 V DC	77...150 V DC	150...264 V DC
Residual overvoltage (clipping voltage)	50 V DC	100 V DC	150 V DC	210 V DC	390 V DC
Opening time growth factor	1.1...1.2				
Operating temperature	-20...+70 °C				
Advantages	Good energy absorption - Unpolarized system - Simple, reliable system.				
Drawback	Delay on drop out which does not however reduce contactor breaking capacity.				

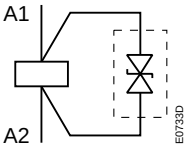
Wiring diagrams



Varistor



RC type



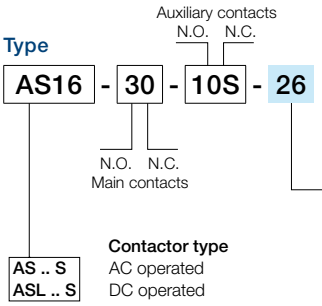
Transil diode

1SBC101602S0201

Voltage code table

The below tables indicate the available coil voltages and corresponding digits for order codes. When placing an order, please give either type or order code. Select a standard contactor from ordering detail pages. Change the **coil voltage code** in the type or in the order code according to the table below. Example: for contactor AS09-30-10S and coil 42 V 50/60 Hz, type is AS09-30-10S-**21** and order code is 1SBL101004R**21**10.

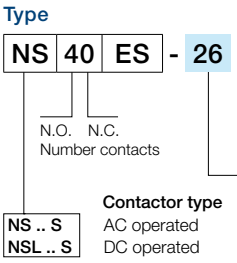
3-pole contactors - with spring terminals



AC coil code	50 Hz	60 Hz
20	24 V	24 V
21	42 V	42 V
22	48 V	48 V
23	110 V	110 V
24	115 V	115 V
16	–	120 V
25	220 V	220 V
26	**230 V**	**230 V**
27	240 V	240 V
17	–	277 V
13	380 V	–
28	400 V	400 V
29	415 V	415 V

DC coil code	
80	12 V
81	24 V
83	48 V
84	60 V
86	110 V
87	125 V
88	220 V
89	240 V

Contactor relays - with spring terminals



AC coil code	50 Hz	60 Hz
20	24 V	24 V
21	42 V	42 V
22	48 V	48 V
23	110 V	110 V
24	115 V	115 V
16	–	120 V
25	220 V	220 V
26	**230 V**	**230 V**
27	240 V	240 V
17	–	277 V
13	380 V	–
28	400 V	400 V
29	415 V	415 V

DC coil code	
80	12 V
81	24 V
83	48 V
84	60 V
86	110 V
87	125 V
88	220 V
89	240 V

Index

Order code classification

Index

Type classification